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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/766,514

01/27/2004

Barrie Gilbert

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11/17/2004

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EXAMINER

NGUYEN, MINH T

ART UNIT

PAPER NUMBER

2816

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/766,514

Applicant(s)

GILBERT, BARRIE

Examiner

Minh Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/5/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the recited terms “back-bias” in claims 14, 16, 18, 20, 23, 27 lack antecedent basis in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 28-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 28-29, the specification does not enable a resistor coupled between the second junction and the current source as recited in claim 28. Note that the resistor R_s shown in Fig. 20 of the present invention does not read on the recited resistor.

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As per claim 30, the specification does not enable a resistor in each constant current stack.

As per claim 31, the specification does not enable a resistor coupled between the node and a current source.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14, 16, 18, 20, 23 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 14, the claim is indefinite because the meaning of the term “back-bias component” is unclear. In other words, it is unclear which component shown in the drawing of the square cell in Fig. 20 of the present invention it is referring to. Clarification is requested.

As per claims 16, 18, 20, 23 and 27, the same problems exist as discussed in claim 14.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

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(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 12-16 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 5,909,136, issued to Kimura.

As per claim 12, Kimura discloses a squaring cell (Fig. 5) comprising:

a first sub-exponential current generator (the combination of Q1, Q2, Q5-Q9, current source 31) for generating a first current (the current at the collector of Q9, the limitation "sub-exponential" is met because formula 17 shown in column 8 is merely the approximation of the first current, see column 8, lines 3-6, i.e., Kimura assumes current gain factor is 1 (which is not) when deriving formula 17) responsive to an input signal V_i (at nodes 11 and 12); and

a second sub-exponential current generator (the combination of Q3-Q4, Q10-Q14, current source 32) for generating a second current (at the collector of Q14) responsive to the input signal V_i ;

wherein the first and second sub-exponential current generators are coupled together (at node 13) to combine the first and second currents.

As per claim 13, Kimura further discloses each of the sub-exponential current generator includes:

a constant current stack (transistors Q1 and current source 31, i.e., Q1 and current source 31 are stacked and current source 31 has constant current I_0) coupled to a first input terminal 11; and

a variable current stack (Q2 and Q5 are stacked and the current through Q2 is not constant) coupled to a second input terminal 12 and the constant current stack (Q1 and Q2 are connected).

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As per claim 14, insofar as understood, the recited "back-bias component" reads on the DC bias for each of the transistors in each of the exponential current generators to ensure these transistors are functioned properly.

As per claim 15, this claim is merely a method to operate the squaring cell having elements and connections discussed in claim 12 above. Since Kimura teaches the circuit, he inherently teaches the recited method.

As per claim 16, rejected for the same reason noted in claim 14.

As per claim 19, the same rejection as discussed in claim 12, and further, since Kimura discloses I_0 is programmable parameter (column 8, line 58), he inherently discloses the recited limitation which is altering the first and second currents. The recited limitation is also met since the input voltage V_I is not a constant voltage. Also, since the first and second currents are altered, the exponential functions are modified.

As per claim 20, rejected for the same reason noted in claim 14.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-18 and 21-27 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent No. 5,909,136, issued to Kimura.

As per claim 17, Kimura discloses steps for squaring a signal as discussed in claim 12, and further, Kimura explicitly discloses I_0 is programmable parameter (column 8, line 58). In other words, he discloses I_0 can be scaled in response to a control signal so that the first and second currents are scaled.

Kimura does not explicitly disclose the step of scaling is performed while generating and combining the first and second currents. In other words, Kimura does not explicitly disclose the step of programming the current I_0 is performed when the circuit is operating.

However, as understood by a person skilled in the art, the ability of programming or making a change of a parameter in a circuit when the circuit is operating is desirable feature because the circuit does not need to be powered down.

It would have been obvious to one skilled in the art at the time of the invention was made to perform the step of scaling in the Kimura circuit while the circuit is operating to save the time needed to power down the system.

As per claim 18, rejected for the same reason noted in claim 14.

As per claim 21, Kimura discloses a multiplier (Fig. 1) comprising:

a first exponential current generator (Fig. 1, box 1, Fig 5 is the detail, transistors Q1, Q2, Q5-Q9, current source 31) for generating a first current (at the collector of Q9) responsive to a first input signal V_x and second input signal $-V_y$;

a second exponential current generator (Fig. 1, box 1, Fig. 5 is the detail, transistors Q3-Q4, Q10-Q14, current source 32) for generating a second current (at the collector of Q14) responsive to the first input signal V_x and second input signal $-V_y$;

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a third exponential current generator (Fig. 1, box 2, Fig. 5 is the detail, transistors Q1, Q2, Q5-Q9, current source 31) for generating a third current (at the collector of Q9) responsive to the first input signal V_x and a third input signal V_y ;

a fourth exponential current generator (Fig. 1, box 2, Fig. 5 is the detail, transistors Q3-Q4, Q10-Q14, current source 32) for generating a second current (at the collector of Q14) responsive to the first input signal V_x and a third input signal V_y ;

wherein the first and second sub-exponential current generators are coupled together (at node 13) to combine the first and second currents.

wherein the third and fourth exponential current generators are coupled together (at node 13) to combine the third and fourth currents.

Kimura does not explicitly disclose each of the exponential current generators responsive to specific input signals as called for in the claim.

However, it is clear from the Kimura's specification that an exponential current generator generates an output current which is exponential to the difference between the input signals applied to its inputs.

It would have been obvious to one skilled in the art at the time of the invention was made to apply specific input signals to each of the four Kimura's exponential current generators as called for in the claim.

The motivation/suggestion for doing so would have been obvious since a skilled artisan knows that the Kimura's multiplier is capable of multiplying any input signals which includes input signals specifically called for in the claim.

As per claim 22, this claim is rejected for the reason discussed in claim 13.

As per claim 23, rejected for the same reason noted in claim 14.

As per claim 24, the combination discussed in claim 21 teaches the structure, the method to operate such structure is seen as obvious.

As per claim 25, the steps of combining are performed at nodes 13 shown in Fig. 1.

As per claim 26, rejected for the same reason and motivation discussed in claim 17.

As per claim 27, rejected for the same reason noted in claim 14.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 12-13, 15, 21-22 and 24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7, 7, 15, 27, 27 and 35, respectively, of copending Application No. 10/192,115. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 12-13, 15, 21-22 and 24 are broader than claims 7, 7, 15, 27, 27 and 35, respectively, of copending Application No. 10/192,115.

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

7. Due to the serious 112, first paragraph problems discussed herein above, patentability of claims 28-31 cannot be determined in this Office action. They will be reconsidered if these claims are amended to overcome the problems.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is **571-272-1748**. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



11/12/04

Minh Nguyen
Primary Examiner
Art Unit 2816